

AMENDMENT

Amendments to the Claims

1. (currently amended) A surgical instrument for implanting ~~[[an]]~~ a thermally deformable anastomotic ring device within a patient, the anastomotic ring device comprising a slidably woven tube of wire at room temperature and an expanded dual headed rivet shape at body temperature, the anastomotic ring device having outer loops or ends which thermally deform and evert when inserted into walls of two adjacent lumens at a luminal interface of an anastomotic site, the ends of the tube everting to form petals in a manner which holds the luminal interface of the anastomotic site into apposition, the surgical instrument comprising:

an actuating member formed of a plurality of expandable proximal leaves and a plurality of expandable distal leaves-which each leaf outwardly actuate actuates by a cantilevered, hinged relationship to a nonexpanding central portion of the actuating member, configured to receive an anastomotic ring and the actuating member moveable between a cylindrical, unactuated position and an expanded actuated position having a hollow rivet forming shape in response to a compressive actuating force, the actuating member configured to control expansion of each end of the thermally deformable anastomotic ring device during at least a significant portion of the implantation process; and

a plurality of distal engaging surfaces, each formed on a respective distal leaf spaced away from the central portion and positioned to engage a selected outer loop of a distal ~~end portion~~ of the unactuated, cylindrical anastomotic ring for pulling the engaged outer loop proximally and outwardly during actuation;

a plurality of proximal engaging surfaces, each formed on a respective proximal leaf spaced away from the central portion and positioned to engage a selected outer loop of a proximal end portion of the unactuated, cylindrical anastomotic ring for pulling the engaged outer loop distally and outwardly during actuation;

a handle including an actuation mechanism for producing the compressive actuating force; and

an elongate cannula connecting the handle to the actuating member and operably configured to position the distal leaves on a distal side of an anastomotic opening and to position the proximal leaves on a proximal side of the anastomotic opening, and

configured to transfer the compressive actuating force from the handle to the actuating member wherein the handle is further operably configured to produce the compressive actuating force by producing a proximally directed longitudinal motion and a distally directed longitudinal motion, the elongate cannula operably configured to separately transfer the proximally and distally directed longitudinal motions respectively to distal and proximal portions of the actuating member to ~~[[pivot]]~~ expandably move corresponding distal and proximal leaves toward ~~each other to actuate the~~ nonexpanding central portion and to controllably expand the thermally deformable anastomotic ring device from a cylinder shape to a hollow rivet shape.

2. (cancelled)

3. (previously presented) The surgical instrument of claim 1, wherein the elongate cannula comprises a first tube connected to the proximal portion of the actuating member and a second tube slidingly received in the tube and connected to the distal portion of the actuating member.

4. (currently amended) ~~[[The]]~~ A surgical instrument of claim 3, comprising:
a surgical instrument for implanting an anastomotic ring device comprising a woven tube of wire having outer loops or ends which thermally deform and evert when inserted into walls of two adjacent lumens at a luminal interface of an anastomotic site, the ends of the tube everting to form petals in a manner which holds the luminal interface of the anastomotic site into apposition, comprising:

an actuating member formed of a plurality of proximal leaves and a plurality of distal leaves which each leaf outwardly actuates by a cantilevered, hinged relationship to a central portion of the actuating member, configured to receive an anastomotic ring and moveable between a cylindrical, unactuated position and a hollow rivet forming shape in response to a compressive actuating force;

a plurality of distal engaging surfaces, each formed on a respective distal leaf spaced away from the central portion and positioned to engage a selected outer loop of a distal portion of the unactuated, cylindrical anastomotic ring for pulling the engaged outer loop proximally and outwardly during actuation;

a plurality of proximal engaging surfaces, each formed on a respective proximal leaf spaced away from the central portion and positioned to engage a selected outer loop a proximal portion of the unactuated, cylindrical anastomotic ring for pulling the engaged outer loop distally and outwardly during actuation;
a handle including an actuation mechanism for producing the compressive actuating force; and
an elongate cannula connecting the handle to the actuating member and operably configured to position the distal leaves on a distal side of an anastomotic opening and to position the proximal leaves on a proximal side of the anastomotic opening, and configured to transfer the compressive actuating force from the handle to the actuating member wherein the handle is further operably configured to produce the compressive actuating force by producing a proximally directed longitudinal motion and a distally directed longitudinal motion, the elongate cannula operably configured to separately transfer the proximally and distally directed longitudinal motions respectively to distal and proximal portions of the actuating member to pivot corresponding distal and proximal leaves toward each other to actuate the anastomotic ring device from a cylinder shape to a hollow rivet shape, wherein the elongate cannula comprises a first tube connected to the proximal portion of the actuating member and a second tube slidably received in the tube and connected to the distal portion of the actuating members and ~~wherein the elongate cannula further comprises a third tube interposed between the first and second tubes and distally engaged to a central portion of the actuating member.~~

5. (original) The surgical instrument of claim 1, further comprising a piercing tip distally coupled to the actuating member.

6. (original) The surgical instrument of claim 5, wherein the piercing tip comprises an enterotomy creation tip.

7. (currently amended) The surgical instrument of claim 6, wherein the piercing tip comprises a veress needle having a syringe knife tip within which a ball translates and ~~springedly~~ springedly withdraws into the veress needle, to expose piercing surfaces.

8. (currently amended) [[The]] A surgical instrument of claim 1, further comprising:
a surgical instrument for implanting an anastomotic ring device comprising a woven tube of
wire having outer loops or ends which thermally deform and evert when inserted into walls of
two adjacent lumens at a luminal interface of an anastomotic site, the ends of the tube
everting to form petals in a manner which holds the luminal interface of the anastomotic site
into apposition, comprising:

an actuating member formed of a plurality of proximal leaves and a plurality of distal
leaves which each leaf outwardly actuate by a cantilevered, hinged relationship to a
central portion of the actuating member, configured to receive an anastomotic ring
and moveable between a cylindrical, unactuated position and a hollow rivet forming
shape in response to a compressive actuating force;

a plurality of distal engaging surfaces, each formed on a respective distal leaf spaced
away from the central portion and positioned to engage a selected outer loop of a
distal portion of the unactuated, cylindrical anastomotic ring for pulling the engaged
outer loop proximally and outwardly during actuation;

a plurality of proximal engaging surfaces, each formed on a respective proximal leaf
spaced away from the central portion and positioned to engage a selected outer loop a
proximal portion of the unactuated, cylindrical anastomotic ring for pulling the
engaged outer loop distally and outwardly during actuation;

a handle including an actuation mechanism for producing the compressive actuating
force;

an elongate cannula connecting the handle to the actuating member and operably
configured to position the distal leaves on a distal side of an anastomotic opening and
to position the proximal leaves on a proximal side of the anastomotic opening, and
configured to transfer the compressive actuating force from the handle to the actuating
member wherein the handle is further operably configured to produce the compressive
actuating force by producing a proximally directed longitudinal motion and a distally
directed longitudinal motion, the elongate cannula operably configured to separately
transfer the proximally and distally directed longitudinal motions respectively to distal
and proximal portions of the actuating member to pivot corresponding distal and

proximal leaves toward each other to actuate the anastomotic ring device from a cylinder shape to a hollow rivet shape; and
an electrical illumination source attached to a distal end of the cannula distal to the actuating member and directing illumination proximally toward the actuating member and comprising a control operably connected proximate to the distal portion of the actuating member.

9. (original) The surgical instrument of claim 8, wherein the actuating member comprises a light transmissive material.

10. (original) The surgical instrument of claim 8, wherein the actuating member comprises an electroluminescent material.

11. (original) The surgical instrument of claim 1, further comprising a pneumatic conduit communicating between the distal tip and the handle for inflating a body lumen.

12. (canceled)

13. (currently amended) A surgical instrument, comprising:
- a cannula;
 - an actuating member distally and laterally presented on the cannula for receiving a generally cylindrical thermally deformable anastomosis ring ~~and, the actuating member~~ formed of a plurality of radially spaced proximal leaves and a plurality of radially spaced distal leaves which each ~~distal~~ leaf outwardly expands ~~actuates~~ by a cantilevered, hinged relationship to a nonexpanding central portion of the actuating member;
 - a first control operative to ~~compress~~ move a longitudinal end of the actuating member toward ~~[[a]] the nonexpanding center~~ central portion of the actuating member to expand ~~actuate~~ a respective end portion of the received anastomosis ring; and
 - a second control operative to ~~compress~~ move another longitudinal end of the actuating member toward the nonexpanding center central portion of the actuating member to ~~actuate~~ expand the other respective end portion of the received anastomosis ring forming a hollow rivet shape;
- wherein the first and second controls are independently actuable to allow independent actuation of either longitudinal end of the actuating member.
14. (canceled)
15. (previously presented) The surgical instrument of claim 13, further comprising a stationary member mechanically grounding the center of the actuating member relative to the cannula.
16. (original) The surgical instrument of claim 13, further comprising an enterotomy creation tip distally coupled to the cannula.
17. (previously presented) The surgical instrument of claim 16, wherein the enterotomy creation tip comprises a veress needle.
18. (original) The surgical instrument of claim 13, further comprising an insufflation conduit distally communicating through the cannula.

19. (original) The surgical instrument of claim 13, further comprising a veress needle which is in pneumatic communication with the insufflation conduit.

20. (currently amended) ~~[[The]]~~ A surgical instrument of claim 13, comprising:
a cannula;
an actuating member distally and laterally presented on the cannula for receiving a
generally cylindrical anastomosis ring and formed of radially spaced proximal leaves
and a plurality of distal leaves which each distal leaf outwardly actuates by a
cantilevered, hinged relationship to a central portion of the actuating member;
a first control operative to compress a longitudinal end of the actuating member toward a
center of the actuating member to actuate a respective portion of the received
anastomosis ring;
a second control operative to compress another longitudinal end of the actuating member
toward the center of the actuating member to actuate the other respective portion of
the received anastomosis ring forming a hollow rivet shape;
wherein the first and second controls are independently actuable to allow independent
actuation of either longitudinal end of the actuating member; and
wherein the longitudinal end of the actuating member controlled by the first control
comprises a distal end positioned with a distal tissue lumen and wherein the
longitudinal end of the actuating member controlled by the second control comprises
a proximal end positioned within a proximal tissue lumen, the surgical instrument
further comprising an illuminator connected to the cannula positioned to illuminate
the distal longitudinal end of the actuating member to illuminate an apposition of the
two tissue lumens.

21. (canceled)

22. (currently amended) The surgical instrument of claim 1, further comprising an ~~[[the]]~~ anastomosis ring, which comprises a woven tube of wire having outer loops or ends which thermally deform and evert when inserted into walls of two adjacent lumens at a luminal interface of an anastomotic site, the ends of the tube everting to form petals in a manner which holds the luminal interface of the anastomotic site into apposition.